asyril Experts in Flexible Feeding Systems

Asyview

Operating Manual

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1. Introduction

1.1. General information

This document is the property of Asyril S.A.; it may not be reproduced, modified or communicated, in whole or in part, without our prior written authorisation. Asyril S.A. reserves the right to modify any information contained in this document for reasons related to product improvements without prior notice. Before using the product, please read this entire document in order to ensure that the product is used correctly. However, if you encounter difficulties when using the product, do not hesitate to contact our customer service department.

In this manual, the safety information that must be respected is split into three types: "Danger", "Important" and "Note". These messages are identified as follows:

DANGER!

Failure to respect this instruction may result in serious physical injury.

DANGER!

This instruction identifies an electrical hazard. Failure to respect this instruction may result in electrocution or serious physical injury due to an electric shock.

IMPORTANT!

Failure to respect this instruction may result in serious damage to equipment.

NOTE:

The reader's attention is drawn to this point in order to ensure that the product is used correctly. However, failure to respect this instruction does not pose a danger.

Reference …

For more information on a specific topic, the reader is invited to refer to another manual or another page of the current manual.

IMPORTANT!

Asyril cannot be held responsible for damage to property or persons caused by the failure to respect the instructions specified in the "Safety instructions" paragraph. It is the client's responsibility to inform the personnel concerned.

NOTE:

All dimensions and values are expressed in millimetres (mm) in this manual.

1.2. Safety instructions

1.2.1. General instructions

DANGER!

Check that the power supplies and other cables are disconnected from the unit before performing any maintenance operations.

DANGER!

Only qualified personnel (trained by Asyril) are authorised to use this product.

DANGER!

Never unscrew the electric units or protective covers of the system. An electric shock may cause serious physical injury. Only Asyril SA personnel are authorised to access these parts for maintenance or repair purposes.

DANGER!

Never disconnect or connect the system cables without being sure that it is switched off.

DANGER!

Modifications to the product are not permitted. Unauthorised modifications could lead to a malfunction, fire and physical injury, etc.

DANGER!

In the event of a power outage, the product must be stopped. Failure to respect this instruction may result in the product restarting accidentally.

DANGER!

Do not use the product in an environment in which it may come into contact with water or oil.

1.2.1.1. Disposal

As soon as the product reaches its end of life, please dispose of it as industrial waste.

NOTE:
The product must be disposed of in accordance with the standards, regulations and laws in force.

1.2.2. Specific instructions

1.2.2.1. Personal Protective Equipment (PPE)

For safety reasons, operators must wear the following safety equipment when using the product:

- Safety goggles when using the Asycube backlight without the diffuser installed. (LED lighting equivalent to class 1 compared to lasers)

NOTE:

It is the client's responsibility to install visual signs informing of the potential dangers and to provide the associated protective equipment.

1.2.2.2. Parties involved

The table below defines the roles of each player:

	Operator	Adjuster	Engineer	Support	Transporter	Dismantler
Construction		X				
Transportation					X	
Installation		X	X			
Commissioning			X			
Use	X					
Programming			X			
Operation	X					
Cleaning	X			X		
Maintenance				X		
Dismantling						X

Table 1-1: Parties involved

1.3. Warranty information

You will find all warranty information (scope, term, etc.) under the general terms of sale.

1.4. Other manuals

The table below provides a list of documents supplied with the product. Each of these manuals forms an integral part of the set of documentation associated with the product.

This current manual contains a technical description of the product, its functionalities, and provides information about the maintenance and transportation requirements of the product.

Manual title	Reference	Description of the content
Asyview Operating Manual	AVIEW-XXX-XX_Operating_Manual_F	THIS MANUAL
Asyview HMI Manual	AVIEW-XXX-XX_User_Interface_Manual_F	Contains information on how to use the user interface for configuring recipes and calibration.
Asyview Programming manual	AVIEW-XXX-XX_Programming_Guide_F	Contains a description of how the product works and information on communication and using the product in programming

Table 1-2: Other manuals

2. Description

2.1. Product overview

The Asyview is a smart vision system which can be used to automatically supply components (Asycube) and for image acquisition and processing from several cameras.

The Asyview comprises:

(A) Vision PC

(B) One or more Vision Boxes for connecting a camera and an Asycube to the Vision PC

Depending on the specific requirements, it can be supplemented with:

(C) Camera

(D) Lens

(E) Lighting

(F) Asycube Mezzo or Forte

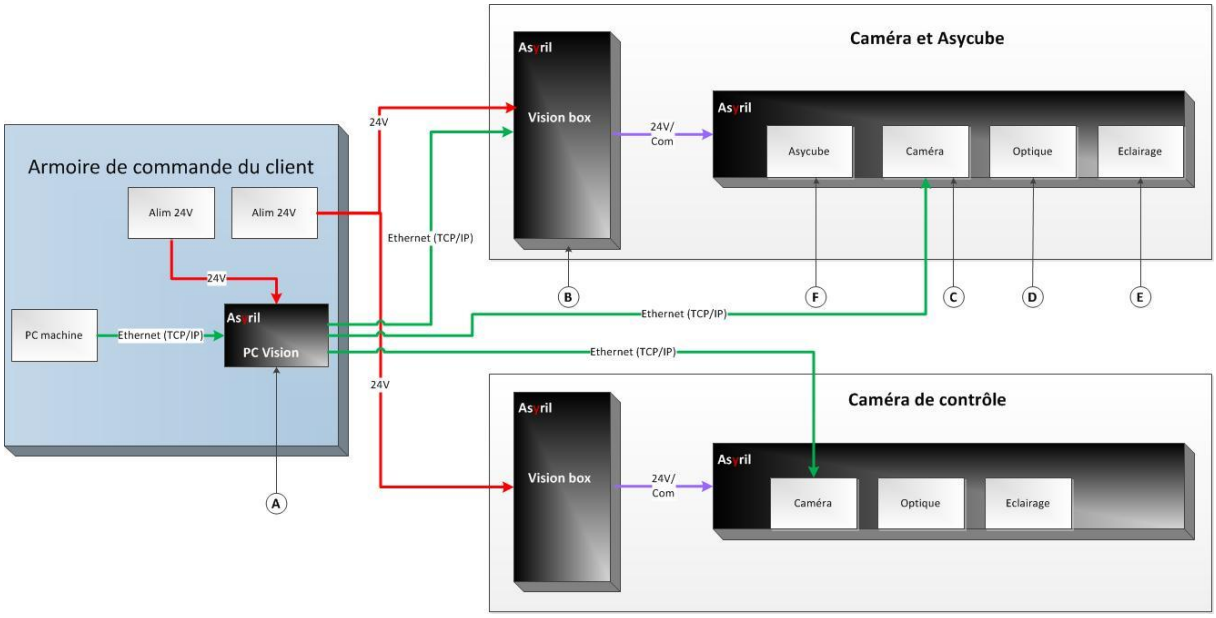


Figure 2-1: General diagram of the Asyview

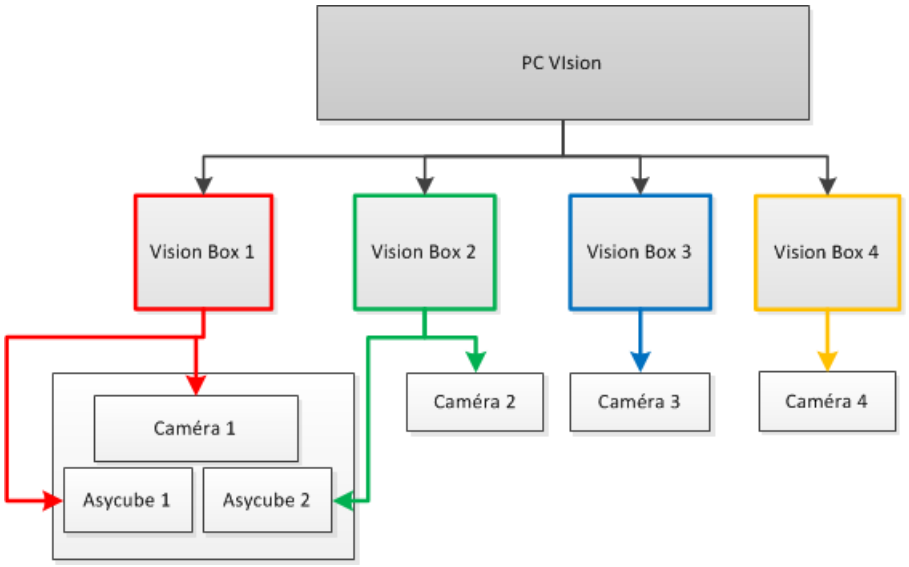


Figure 2-2: Example of Vision Box distribution, cameras and Asycube

NOTE:
The operating modes are explained in the user documentation. Software and hardware can only be configured by Asyril.

For further information on wiring the components, see chapter "2.4 Electrical interfaces*".*

2.2. General characteristics

IMPORTANT!

Never try to use the product outside its specifications. Failure to respect these specifications will invalidate the product warranty.

2.2.1. Technical data

	Asyview
Description	Smart vision system
Number of cameras per PC	4
Number of Asycubes per PC	4
Possible pixel size	Information given in Table 2-6
Number of lighting devices	2 per camera
Type of materials detectable	Metal, jewels, ceramics, glass, semiconductors.
Component position and orientation detection	✓ (subject to conditions)
Detection of heads or tails	✓ (subject to conditions)
Noise volume	< 60 dBA (Asycube)
Easy configuration of a new recipe	✓
Working distance	Depends on installation

2.2.2. General dimensions

2.2.2.1. Vision PC

Characteristic	Value
Dimensions [mm] (W x H x L)	195 x 90 x 268

Figure 2-3: Vision PC

2.2.2.2. Arrangement of camera and Asycube

The distances H1, H2 and H3 depend on the configuration chosen in terms of the field of vision and the resolution, the components defined and the constraints of the installation. These values are sent by Asyril with each order.

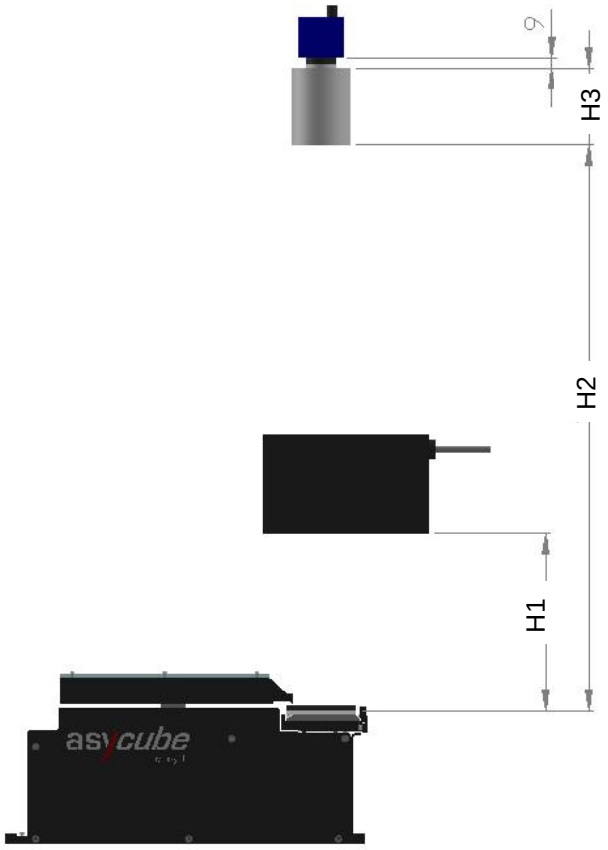


Figure 2-4: Arrangement of the camera-lighting-Asycube assembly.

2.3. Vision performance levels

2.3.1. Different types of lighting

For each camera, one or more types of lighting can be adopted:

- dark field
- backlight
- co-axial lighting (DOAL or telecentric)

The figure opposite shows the different types of lighting available.

For further information on the possible camera/lighting combinations, see subsequent chapters.

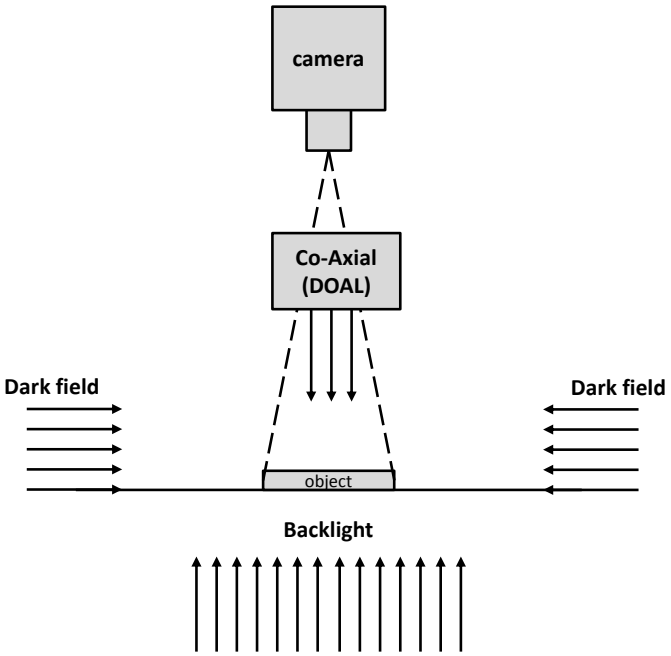


Figure 2-5: types of lighting available

2.3.2. Asycube lighting

The table below summarises the lighting combinations proposed:

Resolution	Field of view	Lighting				
		DOAL 150	DOAL 100	DOAL 75	DOAL 50	Integrated backlight
2 MPx	46 x 35 mm Asycube Mezzo	*On request*	✓	✓	✗	✓
	52 x 67 mm Asycube Forte	✓	✓	✗	✗	✓
5 Mpx	30 x 25 mm Asycube Mezzo	*On request*	✓	✓	✓	✓
	46 x 35 mm Asycube Mezzo	*On request*	✓	✓	✗	✓
	52 x 67 mm Asycube Forte	✓	✓	✗	✗	✓

Table 2-1: Asycube lighting

2.3.2.1. Effect of each type of lighting

The type of lighting chosen may highlight certain specific areas of the part to be observed or detected. The table below gives the example of a jewel bearing lit from two different angles: backlighting or incident lighting.

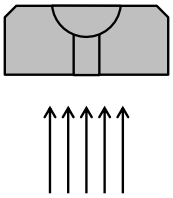
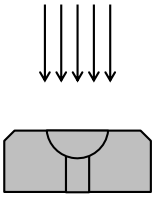
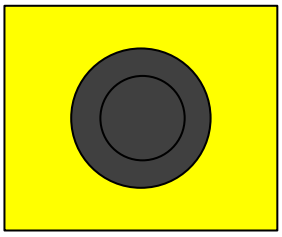
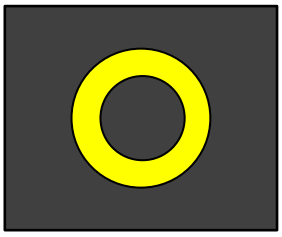
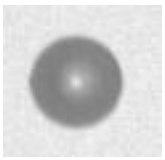
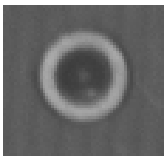
	Lighting	
	Backlighting	**Incident lighting**
Example of a jewel bearing lit (backlighting or incident lighting)		
Areas of the part lit (shown in yellow)		
Actual photo		

Table 2-2: Effect of types of lighting on Asycube

2.3.3. Control camera lighting

The table below summarises the lighting combinations proposed:

Resolution	Field of view	Lighting	
		Incident lighting DOAL 25 or telecentric	**Dark field lighting Dark field 50**
1 Mpx	*Depends on the application*	✓	✓
2 Mpx	*Depends on the application*	✓	✓
5 Mpx	*Depends on the application*	✓	✓

Table 2-3: Lighting on the control camera

2.3.3.1. Effect of each type of lighting

The type of lighting chosen may highlight certain specific areas of the part to be observed or detected. The table below gives the example of a metal part lit from two different angles: incident or dark field.

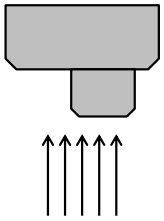
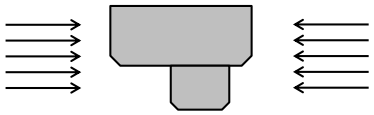
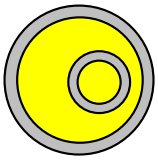
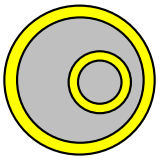
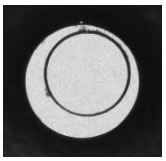
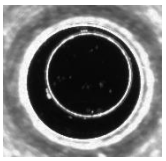
	Type of lighting	
	Incident lighting	**Dark field lighting**
Example of part lit (dark field or incident lighting)		
Areas of the parts lit (shown in yellow)		
Actual photo		

Table 2-4: Effects of types of lighting on a control camera

2.3.4. Detection limit

In order to define a detection limit associated with the Asyview, two situations must be determined:

- Either you want to locate a precise detail (for example, to check whether a part is present on the surface of the Asycube, or to perform a quality check on the diameter of a hole, etc.). In this case, the detail must be greater than 20 pixels in size to achieve quarter pixel localisation accuracy.
- Or you only want to check the presence or absence of a component without actually locating it, in this case, a size of 10 pixels is sufficient.

Table 2-5 summarises the minimum size that a part or specific detail must have in order to be able to locate them or detect them accurately.

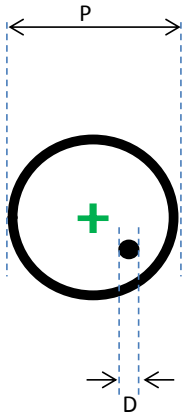
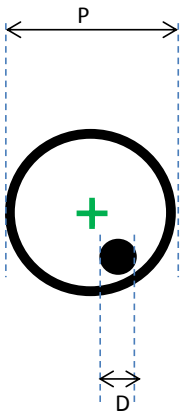
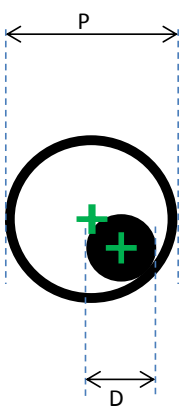
Size of part [pixels]	P < 20 px	P > 20 px		
Size of detail [pixels]			D < 10 px	10 px < D < 20 px	D > 20 px
Example					
Location of part	✗	✓ ¼ px accuracy	✓ ¼ px accuracy	✓ ¼ px accuracy	✓ ¼ px accuracy
Detail detection			✗	✓	✓
Detail localisation			✗	✗	✓ ¼ px accuracy

Table 2-5: Detection limit

The pixel-millimetre conversion depends on the field of view as well as the resolution of the camera. The table below provides information about pixel-micron conversions.

Resolution	Size of sensor		Field of view		Minimum size of the detail in pixels	Minimum size of the detail in microns
	Width	Length	Width	Length		
Mpx	px	px	mm	mm	px	µm
2	1200	1600	35	46	20	575
					10	288
					1	29
2	1200	1600	52	67	20	837
					10	418
					1	42
5	2050	2448	25	30	20	245
					10	123
					1	12
5	2050	2448	35	46	20	376
					10	188
					1	19
5	2050	2448	52	67	20	530
					10	269
					1	27

Table 2-6: Minimum size of detectable elements

2.4. Electrical interfaces

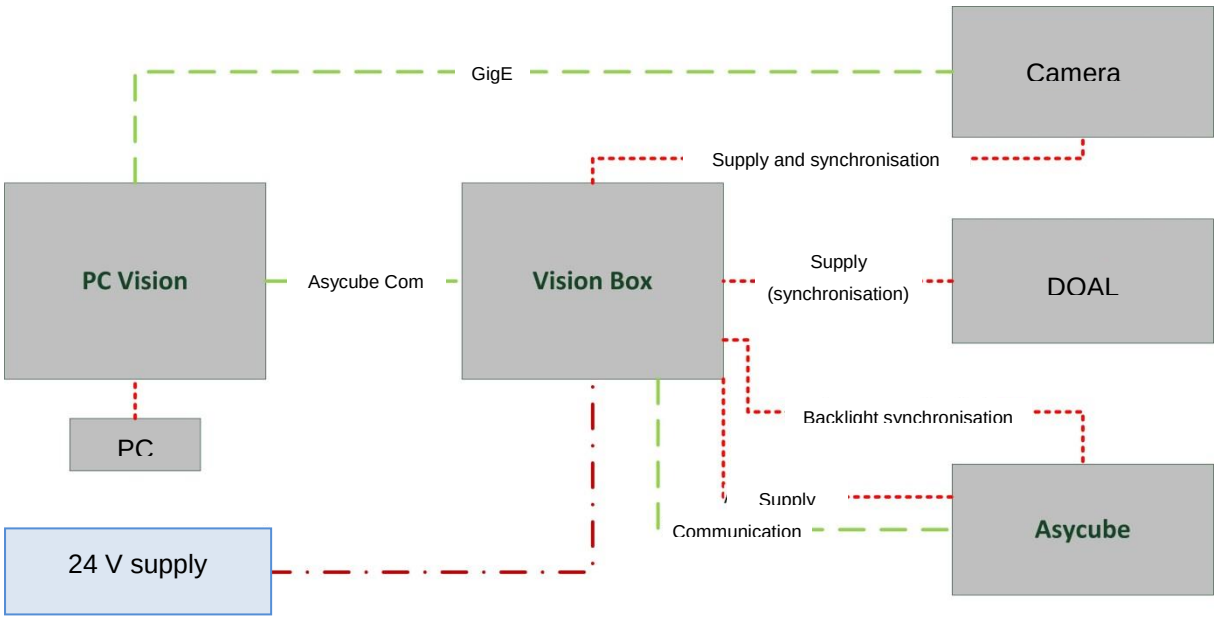


Figure 2-6: General overview of connections

For further information on wiring the components, see the Vision Box wiring diagram.

The customer provides the Vision Box 24 VDC supply. The Vision PC is delivered with its own power supply.
The supply and communication cables can be ordered in different lengths depending on how the machine will be integrated on the customer's premises.

NOTE:
Any Ethernet cable connecting a camera or Vision PC must be **category 6**.

2.4.1. Vision PC

External connection to Vision PC is authorised via a Remote Desktop connection. A second port is assigned for communication with the machine's computer. All the other ports are configured by Asyril for the Asycube supply systems and cameras, depending on the options chosen. The table below shows the IP addresses for the ports to be used by the customer:

The figure below gives information on the Ethernet connection from the vision PC to the various components:

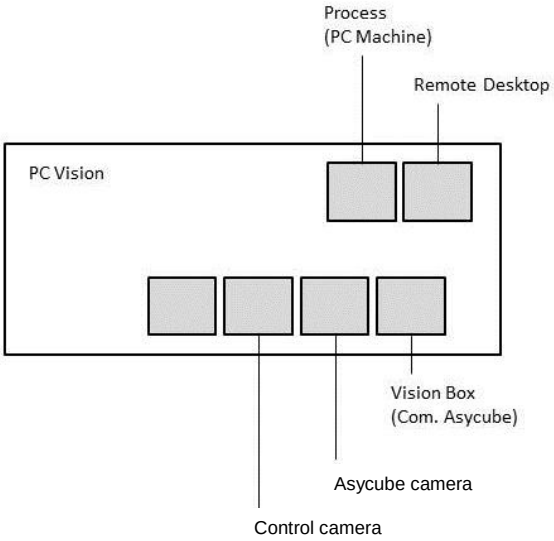


Figure 2-7: Vision PC Ethernet connection

Unit	IP address	Subnet Mask
Remote Desktop	192.168.1.70 (to be modified according to your network)	255.255.255.0
Machine PC	192.168.0.70 (can be changed)	255.255.255.0

Table 2-7: IP addresses

Specifications	Value
Voltage	24 VDC
Power	120 W Adapter

Table 2-8: Vision PC supply

2.4.2. Connection to the Human-Machine interface (HMI)

The graphical interface is installed on the Vision PC. A keyboard, mouse and screen (supplied by the customer) are necessary for interaction and can be connected to the Vision PC via the USB interfaces. A DVI connector is used to connect an additional screen necessary to configure new recipes.

The screen must have the following characteristics:

Characteristic	Value
Resolution	1280 x 1024

Table 2-9: screen resolution for HMI

2.4.3. Power connection

The main power supply required by the Asyview is:

Electrical characteristic	Value
Voltage	24 VDC
Current	15 A
Power	360 W

Table 2-10: supply

IMPORTANT!

- Before the product is powered on, check that your voltage specifications correspond to those of the product.
- Never disconnect the power cables when the system is in operation. Always switch off the machine before disconnecting the cables.

IMPORTANT!

Ensure that no production programme is in operation when the machine is being stopped.

2.5. Mechanical interfaces

2.5.1. Vision PC and Vision Box

The Vision PC is fixed onto two rails, the dimensions of which are described in Figure 2-8. The Vision Box is supplied on a DIN rail.

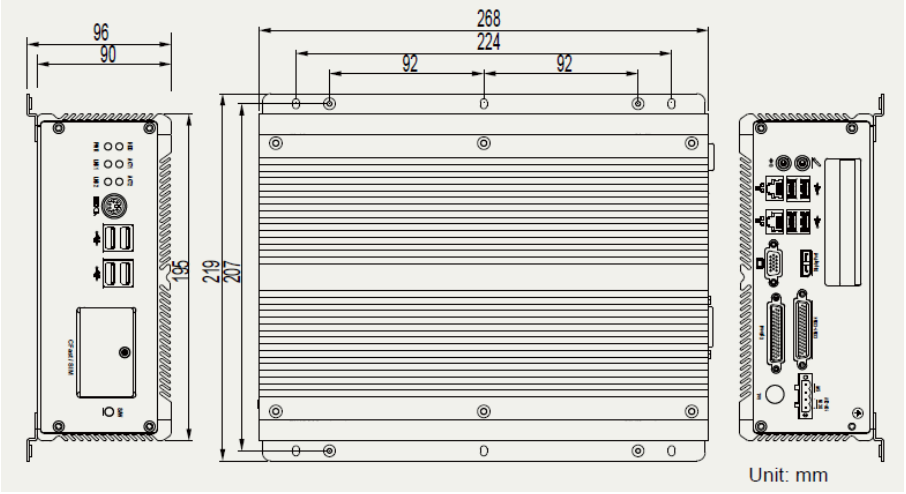


Figure 2-8: Dimension of Vision PC and its mounting rails

For further information, refer to the Vision Box wiring diagram.

The customer is responsible for assembling and integrating the Vision and Asycube components and for wiring the various components. The quality of the images obtained depends on the correct alignment of the cameras, lighting and Asycube. Particular care must therefore be taken with the various media and with the settings when assembling these components.

2.6. Accessories and optional modules

These components are defined by Asyril according to customer requirements. Asyril is then sent all the information relating to these components and their integration (mechanical integration in particular). The key information on the choice of equipment and our suppliers is provided below.

2.6.1. Camera

All the cameras which can be connected to the Asyview are SVS-Vistek cameras. Their dimensions and mounting components are illustrated in Figure 2-9.

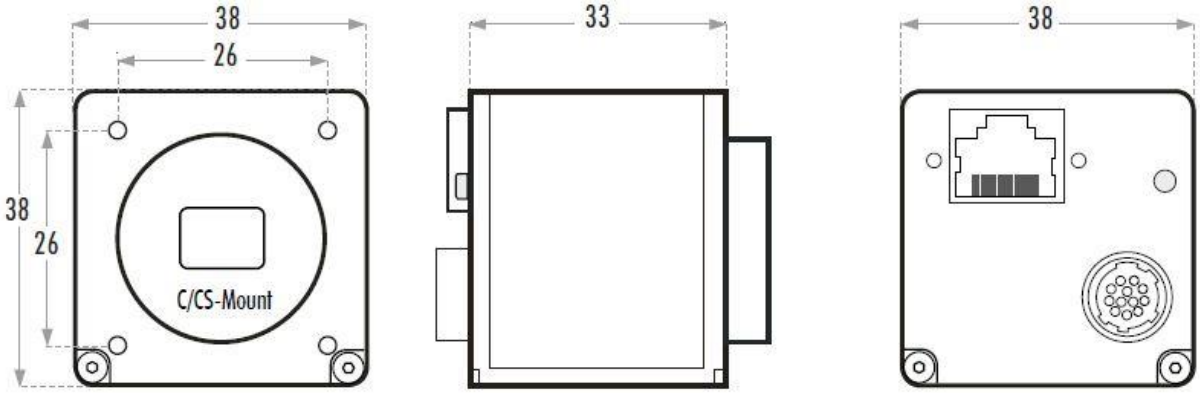


Figure 2-9: dimensions and mounting of cameras (4xM3)

2.6.2. Lens

Like the choice of cameras and lighting, the choice of lens depends on the specific details of the request. We generally use Schneider-Kreuznach, Qioptic, Tamron or Schott-Moritex lenses.

Information relating to the lenses chosen is sent once the specific details have been decided.

2.6.3. Lighting

We mainly work with Métaphase lighting systems. In addition to using the specific type and size of lighting for your requirements, the lighting supply must be 24 VDC (max. 3A), not AC.

Information relating to the lighting chosen is sent once the specific details have been decided.

2.6.4. Asycube

The Asycube User Manual provides all the information relating to the Asycube's electrical and mechanical interfaces.

2.6.4.1. Asycube Forte calibration plate

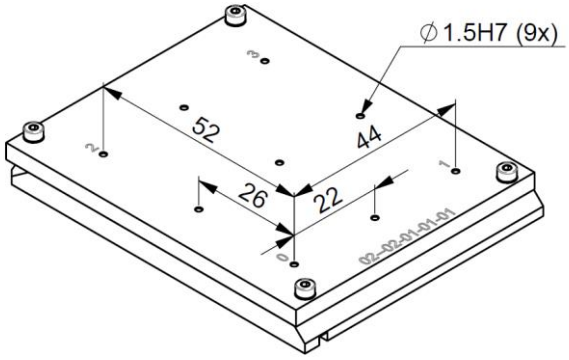


Figure 2-10: Asycube Forte calibration plate

2.6.4.2. Asycube Mezzo calibration plate

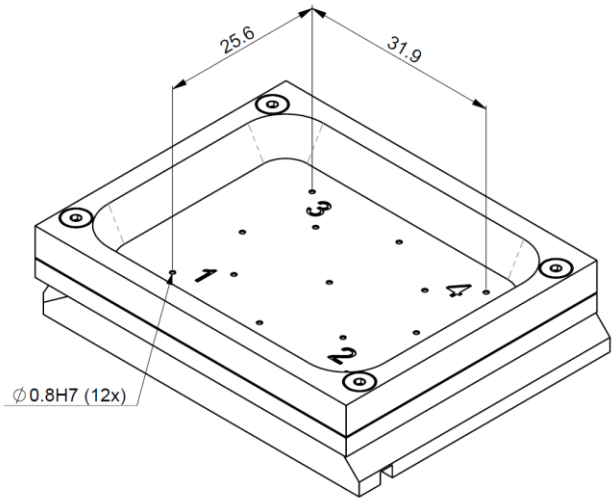


Figure 2-11: Asycube Mezzo calibration plate

For more information about the calibration procedure, refer to the user manual.

3. Transportation, handling and installation

3.1. Product packaging, transportation and handling

The product must be transported in accordance with the specifications indicated on the package (top, bottom, fragile, etc.). In addition, the following points must be strictly respected:

IMPORTANT!

- Take adequate precautions during handling.
- Do not climb on the package.
- Never place heavy objects on the package.
- Take particular care to avoid damaging the product during transportation.

3.2. Unpacking instructions

Before unpacking, please check the condition of the ShockWatch label. In order to ensure a problem-free delivery, all Asyril products are dispatched with this label. This label contains an indicator that breaks if the package is mishandled. If the content of this indicator is red at the time of delivery:

(A) Ask the transporter to be present at the time of unpacking.

(B) Pay particular attention to the external condition of the product.

(C) If any damage is noted, do not sign the receipt and contact Asyril immediately.

(D) In all cases, indicate the condition of the ShockWatch label on the delivery note.

Figure 3-1: ShockWatch

NOTE:

If the products received do not match your delivery note, or are delivered in poor condition, do not sign the receipt and contact Asyril as soon as possible.

3.3. Installation and storage environment

3.3.1. Installation environment

The Asyview system must be used under the following conditions:

- Work temperature: +5°C to +40°C
- Pay particular attention to dust: the system must be used in a clean environment.
- Avoid exposing the AFEED system to direct light radiation that is too intense. Failure to respect this instruction may result in poor operation of the vision recognition system.
- Humidity: from 30% to 95% max. without condensation.

IMPORTANT!

In cases of extreme humidity, please note that the performance of the component supply may be impaired. In addition, for humidity levels below 30%, electrostatic forces may disrupt the behaviour of the parts.

- Avoid powerful electromagnetic waves, ultraviolet light or other radiation.
- Do not use the product in an area where it may be exposed to water or oil projections.
- ISO7 and ISO8 type cleanroom applications

IMPORTANT!

The product must not be used in a corrosive gas atmosphere. Oxidation may occur, resulting in damage to the product.

3.3.2. Storage environment

The storage environment of the product must be similar to its operating environment.

4. Maintenance and repair

4.1. Safety instructions

4.1.1. General instructions

IMPORTANT!

No maintenance operation must be performed inside the product. To perform internal maintenance operations, please contact Asyril. Failure to respect this requirement will invalidate the warranty.

DANGER!

Never use the system when it is damaged. Check that you have resolved the problem before restarting the machine.

DANGER!

Stop the system and disconnect it from its supply before carrying out any maintenance operation.

DANGER!

Never pour water over the product. Spraying water over the product or cleaning it with water may cause serious malfunctions, or cause injuries due to the associated electrical danger.

4.2. Personnel responsible for maintenance or repair operations

Maintenance operations must be performed by trained personnel. Three categories of personnel are defined:

(A) Maintenance technicians who have not undertaken the training provided by Asyril
(B) Maintenance technicians who have undertaken the training provided by Asyril
(C) Asyril maintenance technicians.

Ensure that the person responsible for the maintenance work performed on the product has read and understood this manual. In all cases, the safety precautions must imperatively be followed.

NOTE:

A report will be written for each maintenance operation performed by Asyril.
For more information about our maintenance service, please consult our After-Sales department.

4.3. Maintenance

NOTE:

The information given in the table below is provided purely for illustrative purposes. The frequency at which these operations should be performed must be adapted according to usage of the product, the operating environment, etc.

4.3.1. Maintenance schedule

The AFEED system and its accessories require little maintenance, however, simple inspections must be performed at regular intervals in order to ensure optimal performance of the product:

	Operation	Period	Personnel	Reference
Optical parts	Visually inspect and, if necessary, clean then recalibrate.	Yearly	C	Contact Asyril
Asyview	Saving recipes	Monthly	B	Refer to the HMI doc.

Table 4-1:Periodic maintenance table

IMPORTANT!

Regardless of the type of maintenance operation, always use genuine Asyril parts.

NOTE:

For Asycube maintenance information, see the Asycube user documentation.

4.3.2. General maintenance

4.3.2.1. Cleaning the optical parts

Visually inspect the optical parts (camera, lens, lighting, etc.) and clean if necessary.

NOTE:

This maintenance operation can only be performed by an Asyril technician.

For more information, please contact Asyril customer services.

4.4. Repairs

This section provides a non-exhaustive list of the replacement parts available for your product. The product should be returned to the manufacturer for any repair work. In exceptional cases, and after approval by Asyril SA, this repair work may be performed in the client's premises by trained personnel.

IMPORTANT!

Regardless of the type of replacement operation, always use genuine Asyril parts.

Two types of parts are defined:

(A) Parts likely to be replaced every year (wearing parts)

(B) Parts likely to be replaced every 5 years.

Description of part	Type	Item number
OPTOCOUPLER PLC-OSP- 24DC/24DC/2	B	210 000 171
ETHERNET CONVERT/SERIAL MOXA NPORT 5150A	B	602 001 602
PC ARBOR FPC-7500-i5-520M	B	602 002 784
CAMERA 2/3'' ECO655 GIGE CCD	B	602 700 140
DOAL LIGHTING 100x100mm2 G LED 24 VDC	B	602 700 348
AC/DC SUPPLY ADAPTER KIT 120W	B	900 000 717
PLATE-FOR-02--01-01-01-01 M-008193	A	660 005 048

Table 4-2: Asyview replaceable electrotechnical parts

4.5. Technical Support

4.5.1. For a better service …

Have you read the FAQ and the check-list and still not found an answer your questions? Before contacting us, please note down the following information concerning your product:

- Serial number and product key for your equipment
- Software version(s) used
- Error message, alarm, or visual signals displayed by the interface.

4.5.2. Contact

You can find extensive information on our website: www.asyril.ch

You can also contact our Customer Service department:

support@asyril.ch +41 26 653 7190

Revision table

Rev.	Date	Author	Comments
V1.0	22.08.2012	DaM	Initial version
V1.1	19.11.2012	BoB	Diagrams added

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